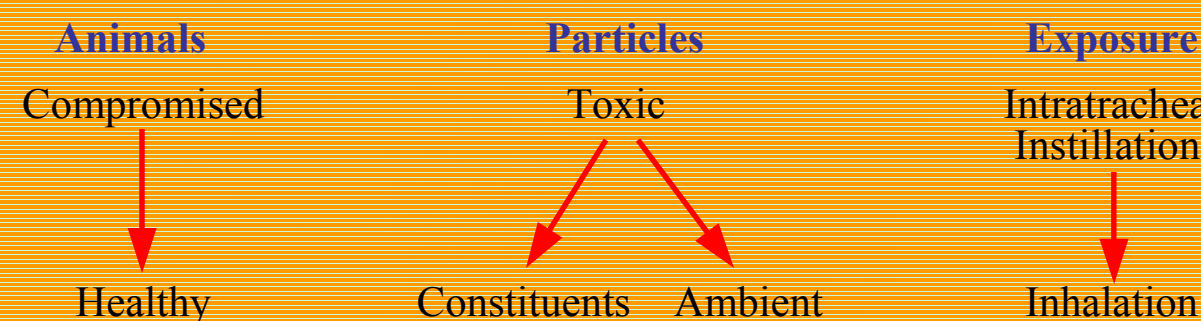


# CARDIOPULMONARY EFFECTS OF EMISSION PARTICULATE MATTER AND PARTICULATE MATTER SURROGATES IN HEALTHY AND COMPROMISED RATS

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## METHODS

### General Approach:



### Methodologies/Procedures:

- radiotelemetry
- whole-body plethysmography
- bronchoalveolar lavage
- electrocardiographic analysis

### Exposure Regimens:

- intratracheal instillation
- nose-only inhalation
- whole-body inhalation
- acute to sub-chronic duration

### PM Species:

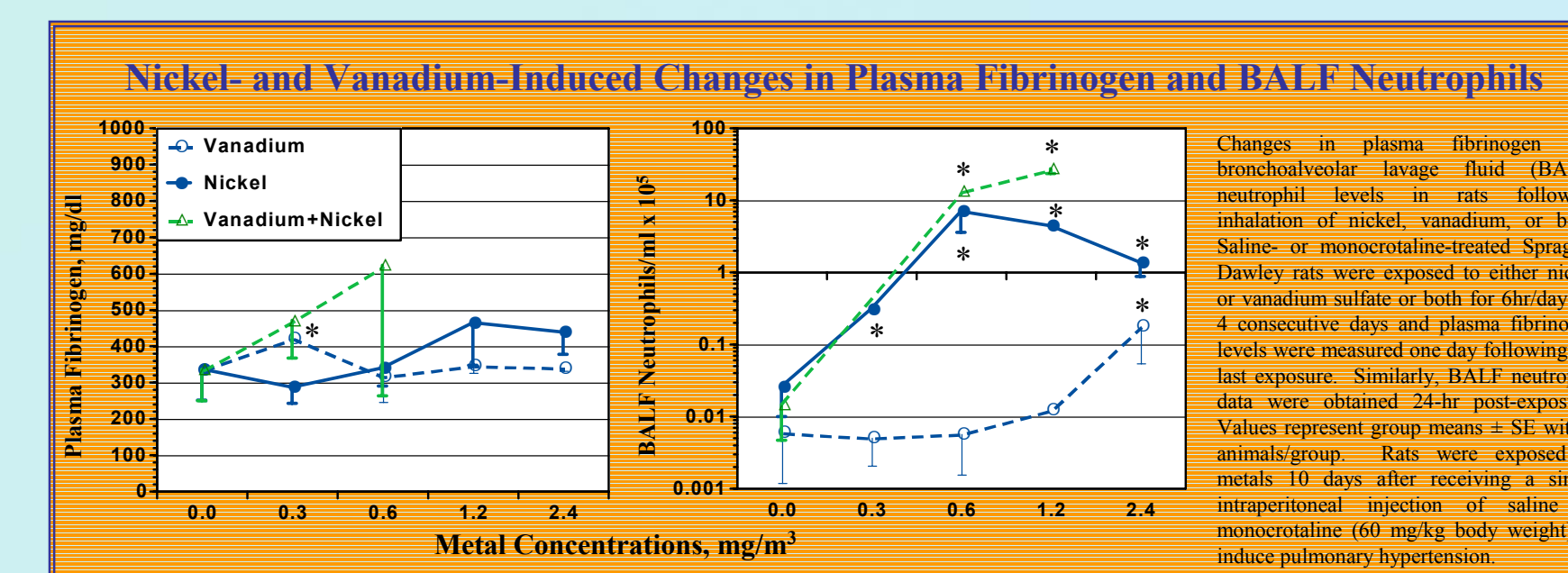
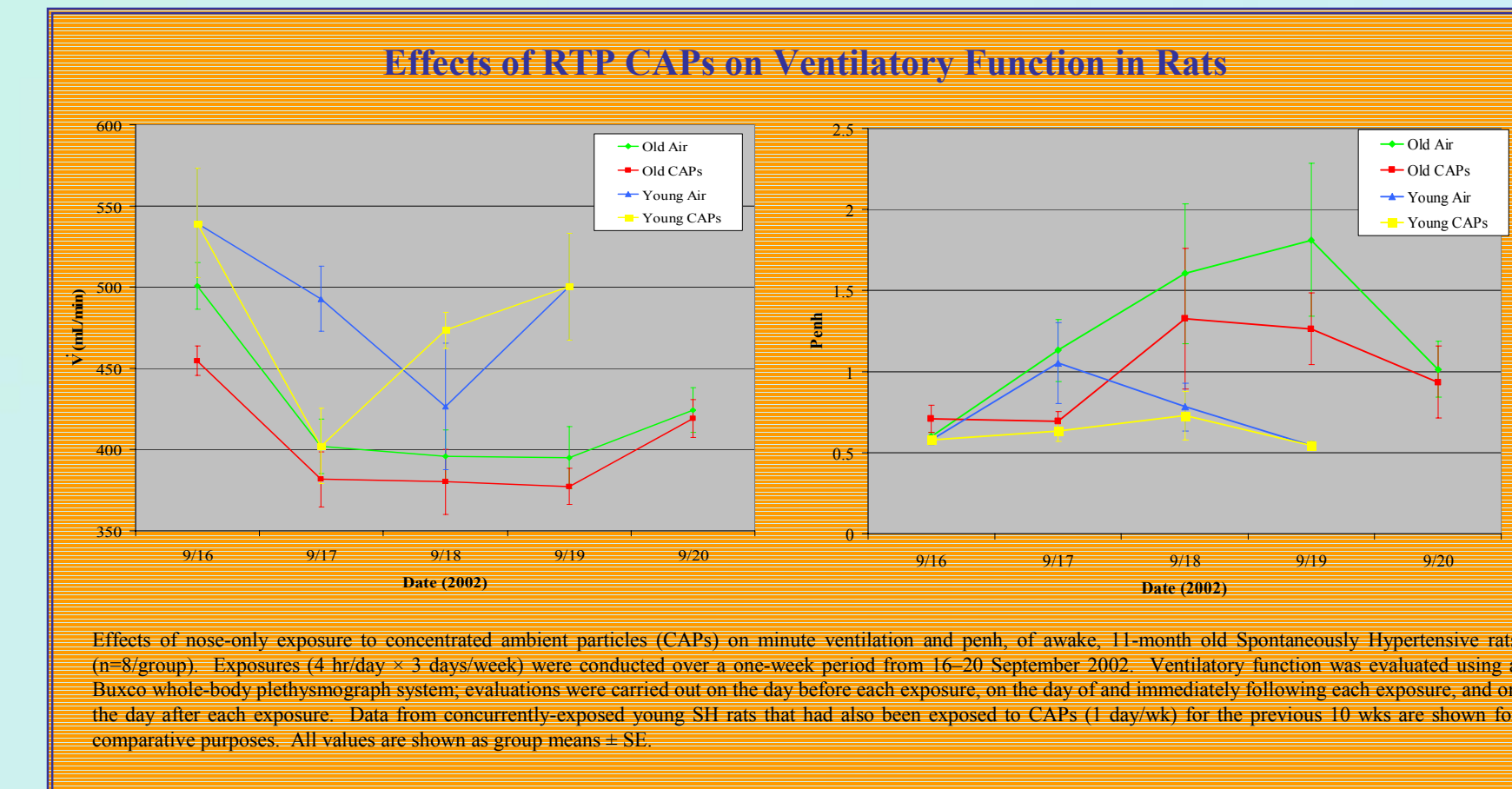
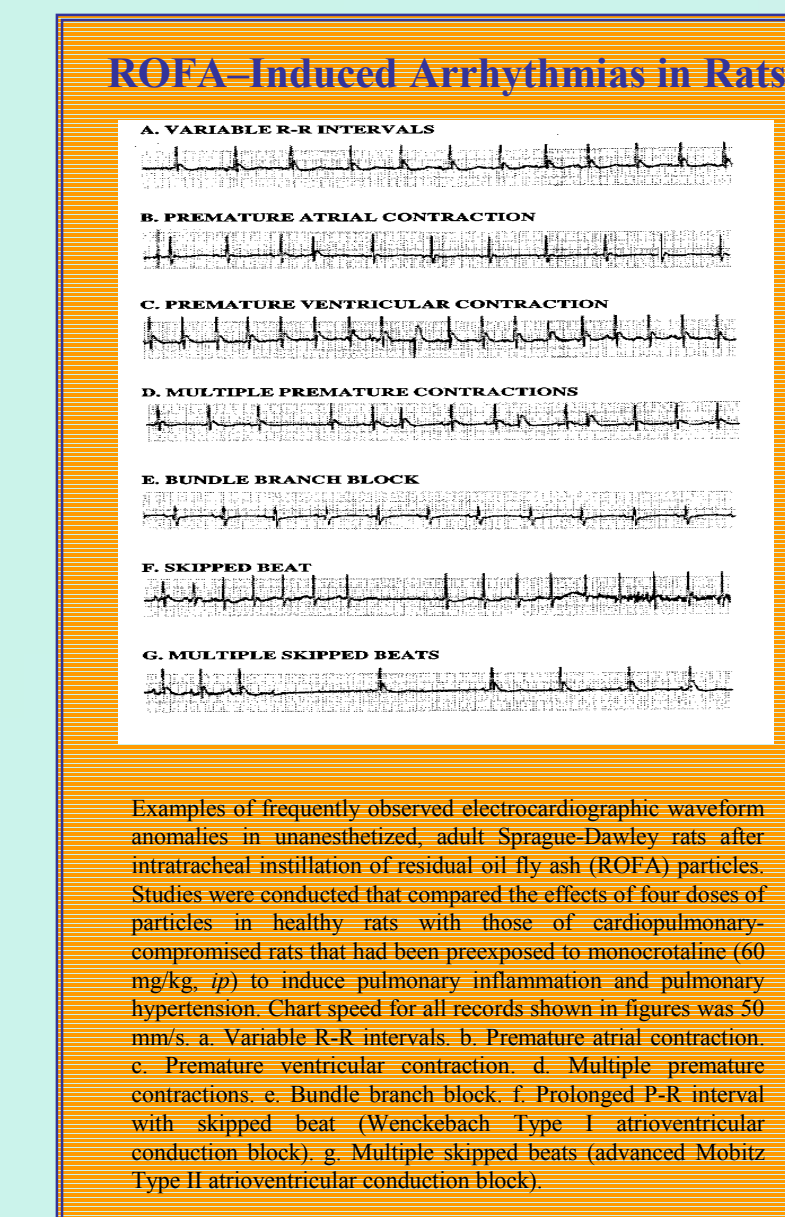
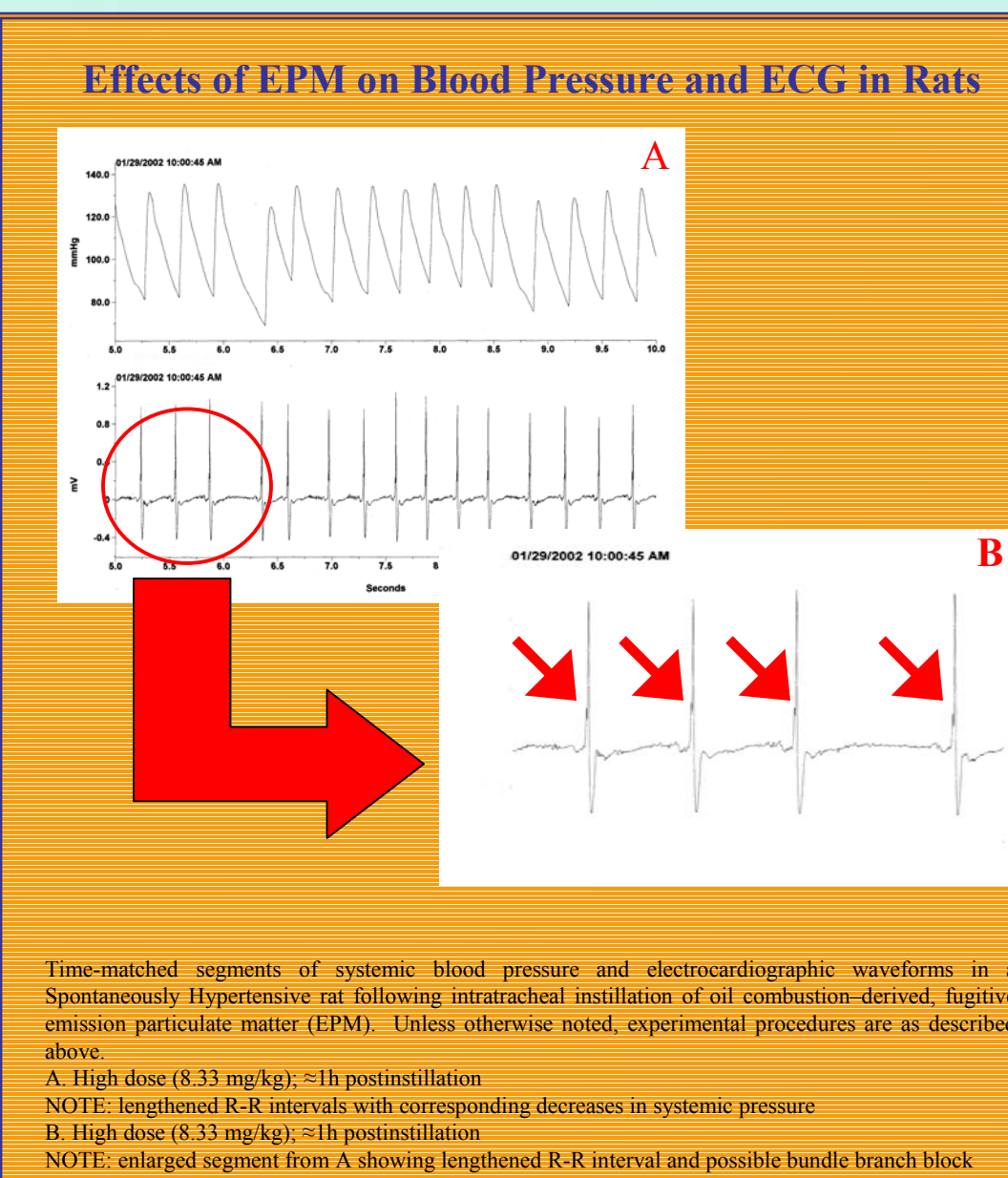
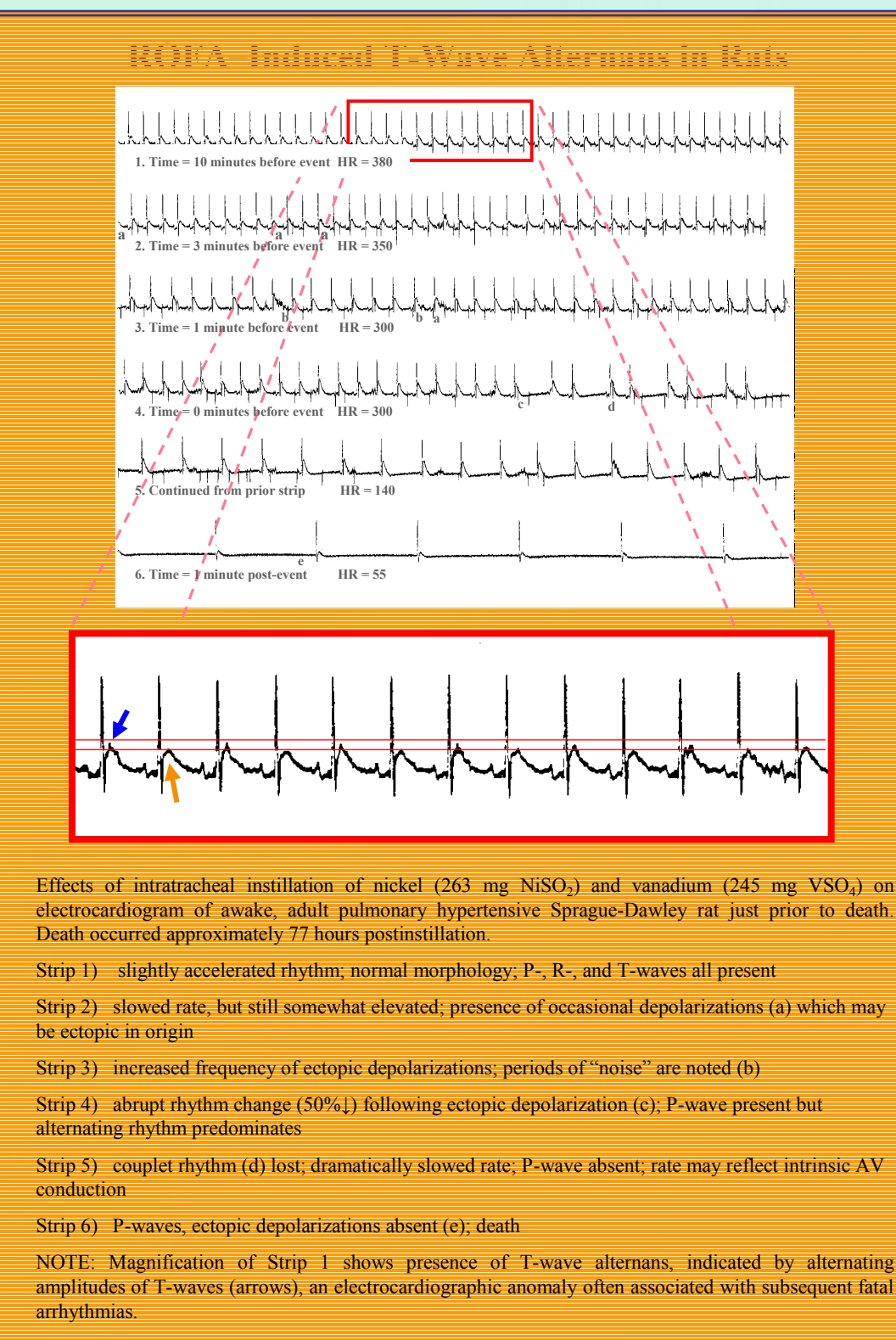
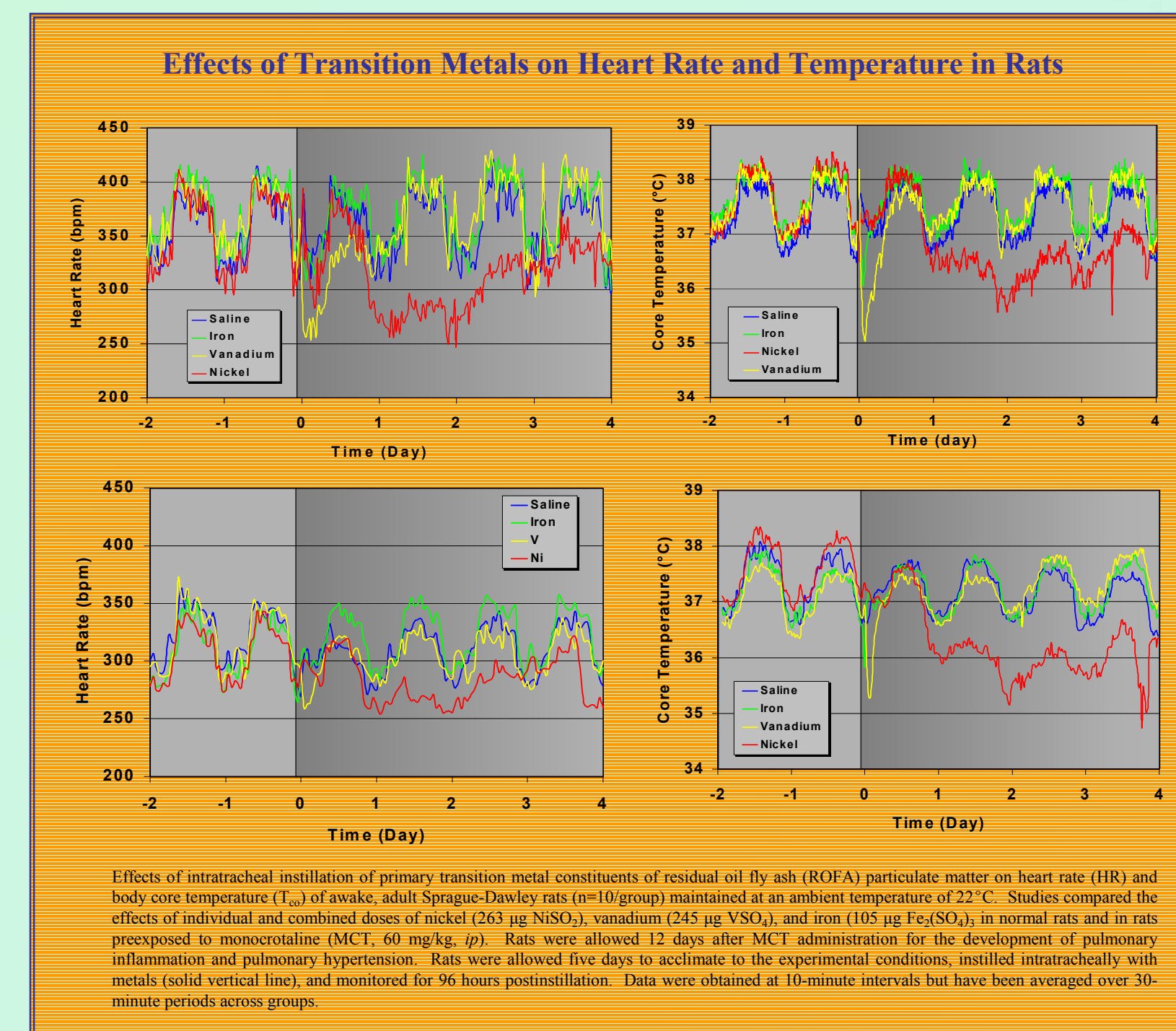
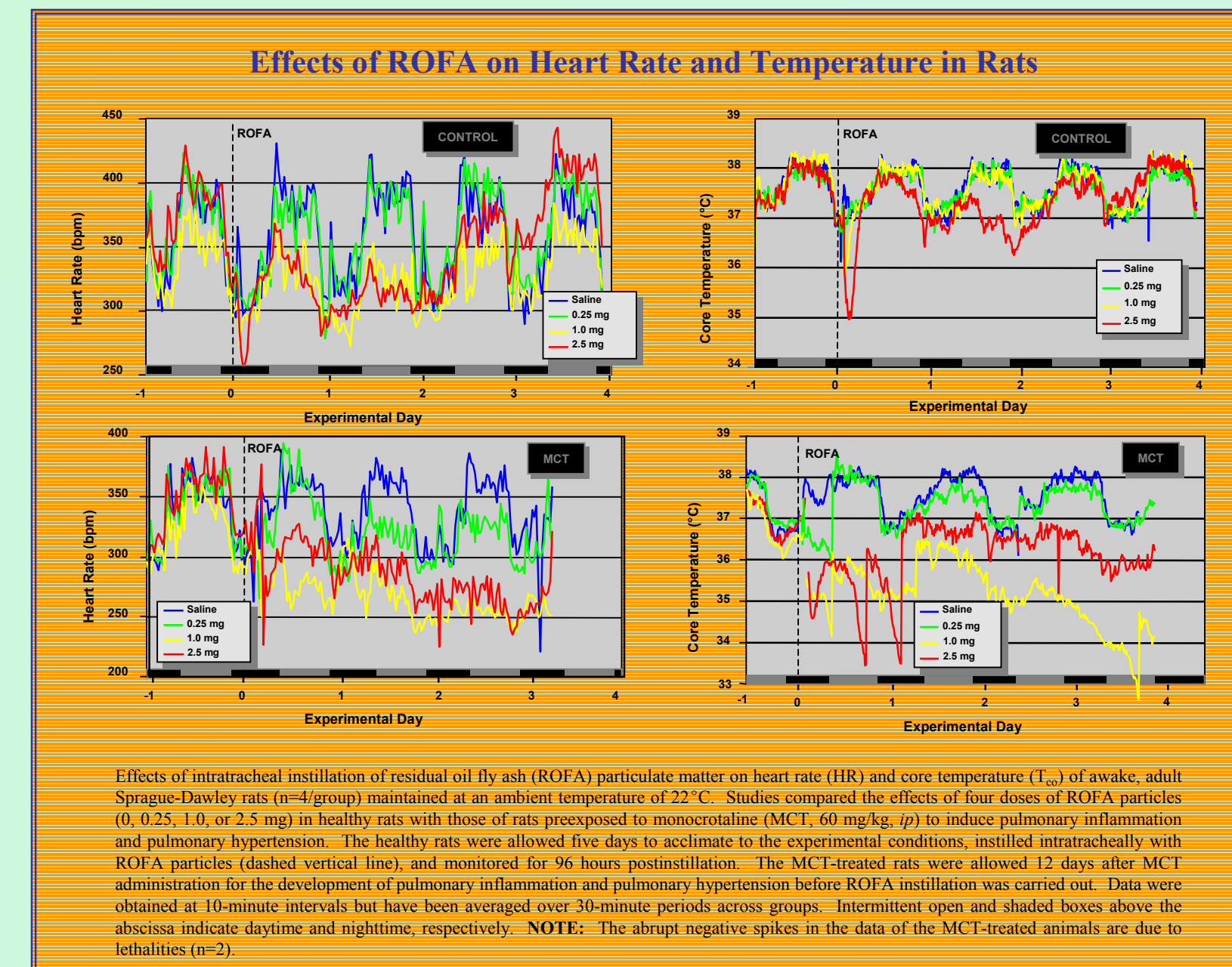
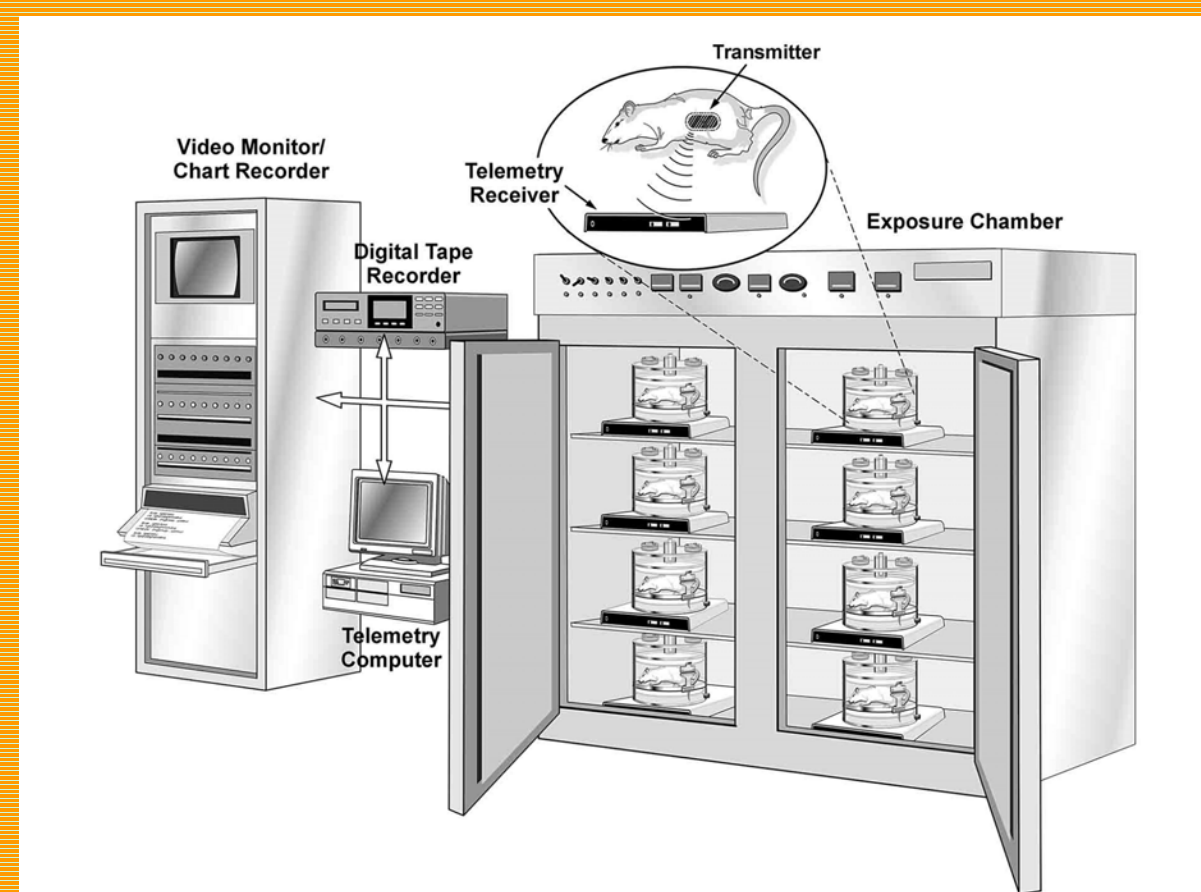
- emission PM (ROFA, EPM)
- urban PM (Baltimore, Ottawa, RTP CAPs)
- natural sources (Mount St. Helen's)
- constituents (Fe, Ni, V)

### Animal Models:

- healthy rats
- systemic hypertension
- pulmonary hypertension
- pulmonary inflammation
- cold-stressed
- aged

### Endpoints:

- HR, BP,  $T_{core}$  activities
- ECG and arrhythmias
- morbidity and lethality
- $f$ ,  $V_T$ ,  $V$ , penh, others
- BALF constituents
- hematologic constituents



## CONCLUSIONS AND IMPACT

• These studies demonstrate substantial decrements in cardiopulmonary function in conjunction with increased pulmonary inflammation

• In general, these studies support the conclusions of the epidemiological studies and implicate a potential role for metals in the toxic response

• These procedures provide a systematic method of examining the cardiopulmonary toxicity of a given species of PM and provide important insights into the mechanism/s by which these effects are mediated

## FUTURE DIRECTIONS

To further investigate the effects and mechanisms of PM-induced toxicity, we propose to develop, characterize, and test new animal models of susceptibility and/or cardiopulmonary disease. These animals will then be exposed via both instillation and inhalation procedures to representative urban PM/PM surrogates. They will be subjected to the full battery of experimental procedures available in our laboratory. Particular emphasis will be placed on developing and improving specific cardiovascular methodologies, such as electrocardiographic interval and heart rate variability analyses, for application to rodent models.